179 TRAINING FACILITIES OTHER THAN BUILDINGS

This basic category includes requirements for weapons ranges, training courses and mockups, training pools/tanks, and parade and drill fields, but it does not include expendable targets.

179 10 AIRCRAFT GUNNERY, BOMBING, AND ROCKET RANGES (EA)

Aircraft Gunnery, Bombing and Rocket Ranges (Aircraft Weapons Ranges) provide air crews with operating areas for the development of proficiency in gunnery, bombing, rocketry, missile delivery, strafing, and mine laying. Ranges should generally be within 100 miles of the supporting air installation. The following criteria are not absolute as far as requirements are concerned; however, any plans to deviate from these criteria shall be referred to the Naval Air Systems Command, Code AIR-535.

Air-to-Air Weapons Ranges. The Air-to-Air Weapons Ranges are Gunnery and Missile Ranges and should, if possible, be over water. The minimum surface impact areas and coincident restricted airspaces, whose minimum altitude is based on the characteristics of the using aircraft, are as follows:

(1) Gunnery Range - 23 nautical miles by 50 nautical miles.

(2) Rocket and Missile Ranges - 50 nautical miles square.

Air-to-Ground Ranges. The Air-to-Ground Ranges are for training in strafing, high-altitude level bombing, loft bombing, close air support, aerial mining, and missile delivery. Communications are required between ground stations and between target controller and aircraft at these ranges. See Table 179-10 for specific surface impact areas, minimum restricted airspace, and other data applicable to air-to-ground ranges.

The following information for Air-to-Ground Weapons Ranges is provided in addition to that contained in Table 179-10.

(1) Strafing Range. A strafing range is for air-to-ground gunnery proficiency training in low-altitude strafing firing 20-millimeter and possibly 30-millimeter ammunition. Targets may be panels or may simulate aircraft, gun emplacements, truck convoys, etc., and may be automatic recording targets.

(2) High-Altitude Level-Bombing Range. The high altitude level bombing range provides training in high-speed, high-altitude, level-attitude bomb releases. The center of the target is visible from 10 nautical miles at 50,000 feet. Offset bombing exercises are also conducted.

(3) Multipurpose Target Range. The multipurpose range is used for training in conventional dive bombing, high-altitude dive bombing, glide-bombing, strafing, and rocketry (excluding controlled air-to-ground missiles). Inert training weapons with small charges are used to facilitate spotting.

TABLE 179-10
Basic Requirement for Air-to-Ground Ranges

Range	Minimum surface impact area (nautical miles)	Minimum restricted airspace (nautical miles)	Maximum altitude of airspace (feet)	Control and spotting towers Note (2)	Target illumination for night operations
A. Strafing	1 x 1/2	radius 5	10,000	1 Control	yes
B. High-altitude level-bombing	radius 3	radius 5	Unlimited	1 Control; Note (3)	yes
C. Multipurpose target	radius 1-1/2	radius 5	Note (1)	Note (4)	yes
D. Loft bombing	radius 1-1/2	radius 5 length 30; Note (8)	24,000 Note (8)	Note (5)	yes
E. Close air support and combat training area	16 x 20	radius 25	Note (1)	Note (6)	yes
F. Aerial mining	3 x 8	3 x 8	Note (1)	Note (4)	no
G. Guided missile	8 x 8	radius 5; length 20; Note (8)	24,000	Note (6) and (7)	yes

NOTES:
(1) The restricted airspace extends vertically to the maximum altitude required by the using aircraft.
(2) See Operational Tower, Category Code 179 35, and NAVFAC DM-27.
(3) Two spotting towers also required to provide accurate three-dimensional rake information where remote spotting devices are not used.
(4) One control and two spotting towers are required to provide accurate three-dimensional rake information.
(5) One control and three spotting towers are required.
(6) One control tower and two spotting towers at each designated target site are required.
(7) Towers are required only at ranges where self-guiding missiles are fired.
(8) See detailed airspace description in text.

(4) Loft Bombing Range. The loft bombing range is a highly instrumented land range for practice bombing with simulated nuclear weapons. A minimum altitude approach is used; bomb release maneuvers practiced include loft, toss, and over-the-shoulder techniques providing training in rapid recovery and escape from atomic-weapon effects, detection, and retaliatory ground fire.

The restricted airspace includes a 5-nautical-mile radius from the target center extending upward from the surface to 24,000 feet above the target and multiple-approach corridors extending 25 miles from target center. A 6-nautical-mile corridor width is required when alternate left or right escape maneuvers are performed. Clearance above the corridors is 3,000 feet for the first 10 nautical miles of the approach, 5,000 feet for the next 8 nautical miles, and 9,000 feet for the remaining 2 nautical miles to the airspace cylinder around the target center. The initial point of aim is at 50,000 feet from the target center which must be visible from an aircraft at 100 feet altitude. Instrumentation along the primary approach to the target provides instantaneous speed measurements, photo coverage, and profile and escape information.

(5) Close Air Support and Combat Training Area. The close air support and combat training area is planned for training with live ordnance, shapes, napalm, and air-to-ground missiles.

(6) Aerial Mining Range. The aerial mining range is planned for training in low-altitude and high-altitude mining. The restricted airspace is generally parallel to an adjacent irregular coastline with readily identifiable landmarks.

(7) Guided Missile Range. The air-to-ground guided missile target range is used for training in controlled air-to-ground missiles.

The restricted airspace is 24,000 feet in height and consists of a rectangular-shaped primary line of approach 4 nautical miles wide by 5 nautical miles long starting at a point 15 nautical miles from the center of the impact area. The total length of the range is 20 nautical miles.

See NAVFAC DM-27 for design criteria and NAVFAC P-272 for definitive drawings of weapons ranges.

179 30 SURFACE PROJECTILE RANGE (EA)

This code is for ranges supporting surface-launched projectiles as opposed to ranges for air-launched projectiles which are coded as 179 10. Criteria are not presently available for surface projectile range requirements.

179 35 WEAPONS RANGE OPERATIONS TOWER (EA)

Range operations towers are used at gunnery, bombing, and rocket ranges to provide an unobstructed view of target areas for purposes of control and spotting impacts. For the tower requirements associated with the various ranges, see Category Code 179 10 (Table 179-10). The two types of weapons

range operations tower are:

1. The control range operations tower (control tower) has a gross area of 1,428 square feet and provides for the radio control of all range activities, including the scoring of training missions both visually and electronically.

2. The spotting range operations tower (spotting tower) has a gross area of 100 square feet and is a secondary observation point to provide for visual scoring.

Location of towers at each range is provided in NAVFAC DM-27. See NAVFAC P-272 for design of a typical tower and NAVFAC DM-27 for design criteria.

179 40 SMALL ARMS RANGE -- OUTDOOR (EA)

A small arms range provides an area for training in the use of pistols, small caliber rifles, and small caliber machine guns. Ranges must be available all year to provide continual training and retraining for personnel who must be proficient in the use of small arms. If feasible, a small-arms range should provide training facilities for all military services within the area.

The capacity of existing ranges or new requirements can be determined by:

(1) Identifying the number of personnel to be trained.

(2) Establish the number and size of training sessions.

(3) Determine the number of hours per session and schedule training over an annual basis.

(4) Calculate the required number of firing points based upon efficient arrangement of the size and schedules of the training groups.

In developing requirements, the base number of training days less holidays and weekends is 242 days. However, ranges require maintenance and periods of recovery for flora and fauna and are often unusable during periods of severe weather or peculiar local limitations. The basic number of training days can be further reduced to 180 days based on local conditions. In the absence of detailed information, compute the number of firing points based on the number of military personnel to be served as follows:

Military Strength	Firing Points
up to 2,000	6
3,500	12
5,000	16
7,000	20

For certain types of small arms and where prevailing weather conditions seriously interfere with scheduling of training, an indoor range (Code 171 50) may be planned.

For outdoor range design, safety criteria, and area requirements, see NAVFAC P-272 and NAVFAC DM-27.

179 45 TRAINING MOCK-UPS (EA)

This code includes mockup structures representing all or parts of ships, aircraft, tanks, or buildings for training personnel in skills such as disaster control, fire fighting, and equipment handling.

179 50 TRAINING COURSE (AC)

This code includes areas designated for personnel training in various skills under actual operational conditions. Table 179-50 outlines the facilities of this group and approximate requirements.

TABLE 179-50
Training Course Criteria

Type of Course	Approximate Size	Terrain	Improvements
Obstacle	2 acres	Flat	Obstacles, drainage
Combat techniques, guerrilla warfare, counterinsurgency	100 acres	Rough, heavy vegetation	Provisional messhall and toilets where justified
Weapons ranges	See Code 179 10		
Disaster control, firefighting, etc.	2 acres	Flat	Training mockups
Field engineering surveying practice	2 acres	Rolling	None
Building construction practice	2 acres	Flat	1,200 square yards of paved area
Construction equipment operations	20 acres	Rolling, no vegetation	None
Vehicle safety, driver testing	6 acres	Flat	Paved area, course markers
Swimming, survival	See Code 179 55		

179 55 COMBAT TRAINING POOL/TANK (EA)

A combat training pool/tank is planned for instructions in swimming and survival under combat conditions. The swimming pool/tank may be provided only as required for training purposes, normally on the following basis: for each increment of 5,000 men to be trained, one swimming pool; pool area not to exceed 13,000 square feet. If survival training is required at installations having less than 5,000 assigned strength, one swimming pool of appropriate size may be provided, but not to exceed 13,000 square feet in pool area. Outdoor pools may be provided where feasible. For a typical swimming pool, see Definitive Designs, NAVFAC P-272, and for design criteria, see Morale, Welfare, and Recreational Facilities, NAVFAC DM-37.

179 60 PARADE AND DRILL FIELD (AC)

This facility provides space for formation drills, parade and review functions, and honor ceremonies. Such a field may be planned for stations having independent command functions. The size of the field is computed on the basis of 1 acre per 125 men, total planned military strength. Surface will be turf where feasible and will be stabilized where climate and other conditions dictate. A reviewing stand may be planned with a capacity based on 5 percent of the total officer strength.

179 70 RADAR BOMB SCORING FACILITY (EA)

A Radar Bomb Scoring Facility (RBS) is used to measure, electronically, aircraft simulated-bombing results and to produce graphic flight path tracking data and other pertinent aircraft target scoring information. An RBS facility is available as a self-contained trailer-mounted facility. The mobile RBS equipment includes an operations trailer, acquisition radar, tracking radar, maintenance and spare parts trailer, and power trailer. A permanent power supply at the range eliminates the power trailer requirement. Criteria are not presently available for a fixed RBS System which would utilize permanent structures. RBS facilities are provided for selected aircraft ranges as determined by CNO.

See NAVFAC DM-27 for design criteria.

179 71 ELECTRONIC WARFARE TRAINING RANGE (EA)

Criteria for the Electronic Warfare Training Range are not currently available.

179 72 UNDERWATER TRACKING TRAINING RANGE (EA)

The underwater tracking range is used primarily to support surface and subsurface weapon system accuracy trials and development, test, and evaluation projects. No planning factors are currently available for this facility. Planning factors, standards, and guides for computing

requirements for facilities under this category are excluded from this publication because of the special provisions and variances in the application of criteria for planning underwater tracking ranges. In the absence of specific criteria, the quantitative requirements for the range facilities should be determined on an individual basis based on the experience and knowledge of the activity involved and the appropriate Systems Commands.